TO D. Zuhs, PhD

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Case No. 142/003/PCT; 03-766)

PATENT

In re Application of: Light et al.	
Serial No.: 09/582,492	**Before the Examiner:** J. Switzer
Filed: March 6, 2002	**Group Art Unit:** 1634
For: Detection of Human Papilloma Virus in Papanicolaou (Pap) Smears	

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION PURSUANT TO 37 C.F.R. § 1.132

I, Gerard J. Nuovo, hereby declare:

1. I am a Professor of Pathology at the Ohio State University Medical Center. I am also a named co-inventor on the above-described patent application. I have an M.D. from the University of Vermont Medical College and have been engaged in research on gynecologic pathology, focusing on cervical diseases, and infectious disease detection, focusing on HPV and *in situ*-based methodologies, for eighteen years. My *curriculum vitae* is attached hereto as Appendix A.

2. I authored an article entitled "Detection of Human Papillomavirus in Papanicolaou Smears: Correlation With Pathologic Findings and Clinical Outcome," which was published in Diagnostic Molecular Pathology in June of 1998 (Nuovo, 1998; *Diagn. Mol. Pathol.* 7:158-63).

3. My 1998 reference discloses the use of Oncor's high-risk HPV consensus probe to detect different oncogenic HPV types in cervical biopsies by *in situ* hybridization under low stringency conditions (p. 159, 161). In particular, my 1998 reference discloses that the Oncor high-risk consensus probe can be used under low stringency conditions to detect the oncogenic HPV types 16, 18, 30, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, and 70, but not the HPV types 6, 11, 42, 43, and 44 (p. 161). My 1998 reference also discloses that Oncor's high-risk HPV consensus probe contains multiple high-risk HPV types (p. 160).

4. My 1998 reference does not disclose the specific composition of the Oncor high-risk HPV consensus probe (*i.e.*, the particular HPV types comprising the consensus probe or proportions of these particular HPV types).

5. Accompanying this Declaration is a copy of my notes from before June of 1998 (Exhibit A) documenting that a high-risk HPV consensus probe comprising 200 ng/ml or 500 ng/ml of HPV type 16 DNA would detectably hybridize to HPV types 6/11 under conditions of low stringency.

6. Using the teachings of my 1998 reference and knowledge in the art at the time my 1998 reference was published, a person of ordinary skill in the art would not be able to determine the particular HPV types or proportions of the particular HPV types comprising the Oncor high-risk HPV consensus probe, and as a result, would not be able to prepare a high-risk HPV consensus probe that does not detectably hybridize to the genomic sequence of a low-risk HPV type.

7. I co-authored an article entitled "A Comparison of Subgenomic and Genomic DNA Probes for Detection and Typing of Human Papillomavirus by in situ Hybridization," which was published in the Journal of Histotechnology in June of 1995 (Nuovo *et al.*, 1995, *J. Histotech.* 18:105-10).

8. My 1995 reference discloses the use of eight different high-risk HPV consensus probes, including high-risk HPV consensus probes obtained from both Digene Diagnostics and ONCOR that contain probes generated from specific subgenomic areas of (i) HPV types 16 and 18 or (ii) HPV types 31, 33, and 35 (page 106).

9. My 1995 reference does not disclose the specific proportions of the probes in the Digene Diagnostics or ONCOR high-risk HPV consensus probes.

10. Using the teachings of my 1995 reference and knowledge in the art at the time my 1995 reference was published, a person of ordinary skill in the art would not be able to determine the proportions of the probes in the Digene Diagnostics or ONCOR high-risk HPV consensus probes, and as a result, would not be able to prepare a high-risk consensus probe that does not detectably hybridize to the genomic sequence of a low-risk HPV type.

11. At the time my 1995 reference was published, a person of ordinary skill in the art would not have appreciated (and, in fact, the named inventors of the above-described application did not yet appreciate) that a high-risk HPV consensus probe that did not detectably hybridize to the

genomic sequence of a low-risk HPV type under low stringency conditions could be prepared by decreasing the proportions of certain probes in the high-risk HPV consensus probe.

12. I have reviewed the article entitled "Human papillomavirus testing by hybrid capture appears to be useful in triaging women with a cytologic diagnosis of atypical squamous cells of undetermined significance," which was published in the American Journal of Obstetrics and Gynecology in March of 1995 (Cox *et al.*, 1995, *Am. J. Obstet. Gynecol.* 172:946-54).

13. At the time the Cox *et al.*, 1995 reference was published, a person of ordinary skill in the art would have appreciated that hybrid capture high-risk HPV probe reagents such as the one disclosed by Cox *et al.* would detectably hybridize to the genomic sequence of a low-risk HPV type, and moreover, would generate false positives with respect to low-risk HPV types.

14. At the time the above-described application was filed, a person of ordinary skill in the art would have expected a high-risk HPV consensus probe to detectably hybridize to the genomic sequence of both low-risk and high-risk HPV types under low stringency conditions, and to not detectably hybridize to the genomic sequence of either low-risk HPV types or high-risk HPV types other than those used to generate the high-risk HPV consensus probe under high stringency conditions.

15. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed: _____
Gerard J. Nuovo

Dated: 9.18.06

To: Jack Kennealy and Ilse Light; ONCOR
From: Gerard Nuovo, MGN Medical Consultants
Re: HPV in situ study
Date:

Dear Jack and Ilse:

I would like to summarize the data/findings that relate to the different issues we discussed recently:

◊ HPV 42, 43, and 44 data. This is summarized in the tables included with this letter. It is clear from this data that high copy HPV 6/11,42,43,or 44 positive cases can cross hybridize with the "high risk" ONCOR probe cocktail (each at 500 ng/ml) at low stringency (1XSSC, 2% BSA, and 45°C for 5 min). Our options are to increase the stringency and/or decrease the concentration of the various probes. To do the latter, we must know the hybridization profiles of the different HPV types.

◊ Cross hybridization profiles of the different HPV types. I performed in situ hybridization using 500 ng/ml of the ONCOR probe cocktails with tissues known to contain a variety of HPV types. The data follows:

Cross hybridization patterns*

	HPV 16	HPV 18	HPV 31	HPV 33	HPV 35	HPV 51
6/11	2+	0	1+	0	weak	0
18	0	3+	0	0	0	
45	0	2+	0	weak	0	0
52	0	0	0	0	2+	0
56	1+	0	1+	0	weak	0

* Done at low stringency.

◊ With this information, we did two sets of experiments:
(a) High stringency wash;
(b) Relationship of signal for HPV 6/11+ case with different concentrations of HPV 16 probes. I chose HPV 16, of course, because it is the one most responsible for the signal with the HPV 6/11 tissues. The data follow:

A

SIGNAL INTENSITY
Varying stringency

Case	HPV type	specific HPV type	Digene Omniprobe	ONCOR consensus
		Low stringency*		
5	6/11	3+ (Digene)	3+	2+
		High stringency*		
5	6/11	3+ (Digene)	3+	0
17	56	Low stringency		
		3+ (Digene)	3+	3+
17	56	High stringency		
		3+ (Digene)	3+	0

* Low stringency = 5 minutes at 45°C in 1XSSC and 2% BSA
*High stringency = 10 minutes at 62°C in 0.1XSSC and 2% BSA

Obviously, the high stringent conditions eliminate the signal with the HPV 6/11 tissue but also cause us to lose the signal with an important "novel" type - HPV 56.

The next strategy was to see if we could eliminate the signal with the HPV 6/11 tissue at low stringency using a lower concentration of the "culprit" HPV 16. The data follows:

B

HPV 16 concentration study

	500 ng/ml	200 ng/ml	100 ng/ml	50 ng/ml	33 ng/ml	25 ng/ml
6/11 hi*	2+	weak	0	0	0	0
16 hi*	3+	3+	2+	weak	weak	weak
16 low*	1+	1+	1+	0	0	0

* The HPV 6/11 tissue was a cervical low grade SIL with strongest signal I have ever seen. Of course, this was done because if we can eliminate the signal with it, then lower copy HPV 6/11 tissues will also be scored as negative.

In summary, it is clear that a concentration for HPV 16 in the probe cocktail of 100-200 ng/ml should greatly facilitate eliminating the HPV 6/11 cross over.

◊ True blue reagent and hybrisol. I used the hybrisol and true blue for the data just reported. Clearly, these work very well.

◊ Novel types (specifically HPV 39,58,59, and 68). My assistant and I are beginning the experiments using PCR to identify and type new HPVs based on the published endonuclease profiles. I've included in this report a paper which describes the identification of HPV 70. As you can see from the abstract, this type strongly cross reacts with HPV 39,59, and 68. Clearly, if HPV 70 could be included in the ONCOR cocktail, this should permit detection of these types. Hopefully, I will find HPV 70 in my collection. A quick and simple way to enhance the ONCOR system is to prepare several oligos of 40-50 bp from the HPV 70 sequence and include this in the cocktail.

◊ Hybrid capture system. I'll briefly review this information, as it was discussed in my recent Email. The Hybrid capture system is done at high stringency, and one must use >4,000 pg of HPV 6/11 to see a signal with the high risk cocktail. Most HPV 6/11 cervical warts would not have such a high copy number. I think the key to stress is that the ONCOR system is superior to the Hybrid capture system in several ways:

⇒ It detects clinical infection whereas the Digene system also detects subclinical infection;

⇒ Because it is done at low stringency, it can detect a greater range of novel high risk HPV types and still avoid detecting the low risk types by using the correct proportion of HPV types in the cocktail;

⇒ The ONCOR system allows the pathologist to identify the infected cell type (ASCUS, dysplasia, eg) whereas the Digene system does not.

SUMMARY

* The key data is the cross hybridization of HPV 6/11 with the high risk types and the realization that we can eliminate the HPV 6/11 signal by adjusting the concentration of the HPV 16 probe and still maintain low stringent conditions.
* The ONCOR system as it stands now does an excellent job in detecting the "still novel" types (ie, not HPVs 16,18,31,33,35,45,51,52, or 56); these must include HPVs 39,58,59, and 68. It hasn't missed one yet! We should maintain low stringency to continue to make this a selling point of the ONCOR system. The high stringency Digene hybrid capture system can't detect these novel types; this is why they are adding yet more types. The inclusion of HPV 70 (all or part) should allow the ONCOR system to perform even better with most of these "still novel" HPV types.
* If we go to high stringency, we will lose the signal of many of these novel types unless we get probes for all or most of them. Although I'll try to isolate

these novel types, I don't think the ONCOR system needs them to be successful whereas the Digene system does need them.

SIGNAL INTENSITY
High risk types
Low stringency

Case	HPV type	specific HPV type*	Digene Omniprobe	ONCOR consensus
1	16	3+	2+	3+
2	16	weak	1+	1+
3	16	2+	2+	2+
4	16	2+	2+	2+
5	18	3+	1+	3+
6	18	3+	3+	3+
7	31	3+	1+	3+
8	33	3+	3+	3+
9	33	3+	3+	3+
10	35	3+	3+	3+
11	45	3+ (digene)	3+	3+
12	45	2+ (digene)	2+	2+
13	51	2+	2+	2+
14	51	1+	1+	1+
15	52	2+ (digene)	2+	1+
16	52	3+ (digene)	3+	2+
17	56	3+ (digene)	2+	2+
18	56	3+ (digene)	3+	3+
19	novel, 45R	45 = 3+	3+	1+
20	novel, 35R	35 = 1+	1+	1+
21	novel, many types	6,16,31/33/35+	3+	3+
22	novel, 16R	1+ (digene)	1+	1+

* The specific HPV type is from the genomic ONCOR probe except for HPV types 45, 52, novel types, and 56 where the Digene probe was used.
The signal intensity varied from 1+ (weak signal, light blue), 2+ (moderate signal, blue), and 3+ (intense signal, blue-black).

SIGNAL INTENSITY
Low risk types
Low stringency

Case	HPV type	specific HPV type	Digene Omniprobe	ONCOR consensus
1	6/11	3+ (Digene)	3+	1+
2	6/11	2+ (Digene)	2+	0
3	6/11	2+ (Digene)	2+	0
4	6/11	1+ (Digene)	1+	0
5	6/11	3+ (Digene)	3+	2+
6	6/11	2+ (Digene)	2+	0
7	42	2+ (Digene)	2+	0
8	43	1+ (Digene)	1+	0
9	44	3+ (Digene)	3+	1+

NEW DATA

ONCOR consensus probe cocktail data

Low stringency

	Digene probe*	Cocktail 1**	Cocktail 2	Cocktail 3
2	0 (3+ HPV 2)	0	0	0
6/11	3+	2+	0	0
6/11	3+	2+	1+	weak
6/11	3+	1+	0	0
6/11	3+	3+	0	0
6/11	2+	1+	0	0
6/11	1+	0	0	0
6/11	3+	1+	0	0
6/11	1+	0	0	0
6/11	3+	1+	0	0
42	2+	ND	0	0
43	2+	ND	0	0
44	2+	0	0	0
16	1+	1+	1+	1+
16	3+	3+	3+	2+
16	3+	3+	3+	3+
16	2+	2+	2+	1+
16	1+	1+	1+	1+
18	3+	3+	3+	3+
31	2+	2+	2+	2+
31	3+	3+	3+	3+
31	3+	3+	3+	3+
33	3+	3+	3+	3+
45	3+	3+	3+	3+
56	3+	2+	2+	1+
56	3+	2+	1+	1+
still novel	3+ (45 related)	3+	3+	2+
	2+ (16 related)	2+	1+	1+

* The digene probe is their type specific probe.

** Cocktail 1 has 500 ng/ml of HPV 16, cocktail 2 has 200 ng/ml HPV 16, and cocktail 3 has 100 ng/ml. Each cocktail has 500 ng/ml of HPVs 18,33,35, and 51 plus 200 ng/ml of HPV 31.

To: Jack Kennealy, PhD and Ilse Light
From: Gerard Nuovo
Re: HPV testing
Date:

Dear Ilse and Jack:

I am sending some more information with regards to HPVs 45,52, and 56. As you can see, HPV 56 can be detected by HPV 31, HPV 52 is most related to HPV 33, and HPV 45 is most related to HPV 18. You may recall that HPV 31 did detect HPV 56 and HPV 18 did detect HPV 45 when I did these tests using the individual ONCOR genomic probes. The fact that HPVs 31,33, and 18 are in the ONCOR consensus probe cocktail at 500 ng/ml explains why we are detecting these types readily at low stringency. We are a bit lucky that HPV 16, which is causing most of the cross over with HPVs 6/11, appears to be less important in detecting the "novel" types (ie, HPVs 45,52,56), and the "still novel" types of HPVs 39,58,59, and 68.

I look forward to talking with you on Friday.

Sincerely,

Gerard Nuovo, MD

SUMMARY OF PREVIOUS DATA

HPV 16 concentration study

	500 ng/ml	200 ng/ml	100 ng/ml	50 ng/ml	33 ng/ml	25 ng/ml
6/11 hi*	2+	weak	0	0	0	0
16 hi*	3+	3+	2+	weak	weak	weak
16 low*	1+	1+	1+	0	0	0

* The HPV 6/11 tissue was a cervical low grade SIL with strongest signal I have ever seen. Of course, this was done because if we can eliminate the signal with it, then lower copy HPV 6/11 tissues will also be scored as negative.

SUMMARY OF PREVIOUS DATA

Detection frequencies of the different HPV types

	500 ng/ml	200 ng/ml	100 ng/ml	50 ng/ml	33 ng/ml	25 ng/ml
6/11 hi*	2+	weak	0	0	0	0
16 hi*	3+	3+	2+	weak	weak	weak
16 low*	1+	1+	1+	0	0	0

* The HPV 6/11 tissue was a cervical low grade SIL with strongest signal I have ever seen. Of course, this was done because if we can eliminate the signal with it, then lower copy HPV 6/11 tissues will also be scored as negative.

* The digene probe is their type specific probe
** Cocktail 1 has 500 ng/ml of HPV 35, cocktail 2 has 200 ng/ml HPV 16, and cocktail 3 has 100 ng/ml. Each cocktail has 500 ng/ml of HPVs 18,33,39, and 51 plus 250 ng/ml of HPV 31.

To: Jack Kennealy, PhD and Ilse Light
FAX: 301-963-1436
From: Gerard Nuovo
Re: HPV testing
Date:

Dear Ilse and Jack:

I am re-sending the FAX of . Also included with this FAX is an update on the ONCOR probe study; note that I have included HPV 52 and another still novel type.

I look forward to talking with you at 300.

Sincerely,

Gerard Nuovo, MD

NEW DATA (n = 57)

ONCOR consensus probe cocktail data

Low stringency

	Digene probe*	Cocktail 1**	Cocktail 2	Cocktail 3
2	0 (3+ HPV 2)	0	0	0
6/11	1+	0	0	0
6/11	1+	0	0	0
6/11	2+	1+	0	0
6/11	3+	2+	0	0
6/11	3+	2+	1+	weak
6/11	3+	1+	0	0
6/11	3+	3+	0	0
6/11	3+	1+	0	0
6/11	3+	1+	0	0
6/11	1+	0	0	0
6/11	1+	0	0	0
42	2+	-	0	0
43	2+	-	0	0
44	2+	0	0	0
16	1+	1+	1+	1+
16	1+	1+	1+	1+
16	2+	2+	2+	1+
16	weak	1+	1+	1+
16	3+	3+	3+	2+
16	3+	3+	3+	3+
18	3+	3+	3+	3+
31	2+	2+	2+	2+
31	3+	3+	3+	3+
31	3+	3+	3+	3+
33	3+	3+	3+	3+
33	2+	2+	2+	2+
35	3+	3+	3+	3+
35	1+	-	-	1+
51	3+	3+	3+	3+
30	3+	3+	3+	3+
30	3+	3+	3+	3+
30	3+	3+	3+	3+
39	2+	1+	1+	1+
39	2+	2+	2+	2+
39	1+	weak	weak	weak
39	3+	3+	3+	3+
39	3+	-	3+	3+
39	1+	1+	1+	1+
45	3+	3+	3+	3+
45	3+	-	3+	3+
52	3+	3+	3+	3+
52	3+	3+	3+	3+
52	2+	2+	2+	2+
56	3+	3+	3+	3+
56	1+	1+	1+	1+
56	3+	2+	2+	1+
56	3+	2+	1+	1+
58	2+	2+	1+	1+
59	2+	2+	2+	-
68	1+	-	1+	1+
70	3+	3+	3+	2+
70	2+	ND	2+	-
70	1+	1+	1+	1+
still novel	2+ (31 related)	2+	2+	2+
	1+ (18 related)	1+	1+	1+
	1+ (18 related)	1+	1+	1+

Cross homology patterns*
Gerard Nuovo, MD
MGN Medical Research Laboratories

TABLE 2.

	HPV 16	HPV 18	HPV 31	HPV 33	HPV 35	HPV 51	HPV 70	HPV 6/11
6/11	0	0	0	0	0	0	0	3+
16	3+	0	weak	0	0	0	0	0
18	0	3+	0	0	0	0	1+	0
30	0	0	0	0	weak	0	0	0
31	weak	0	3+	0	0	0	0	0
33	0	0	0	3+	0	0	0	0
35	0	0	0	0	3+	0	0	0
39	0	1+	0	0	0	0	1+	0
41	0	0	0	0	0	0	0	0
45	0	1+	0	0	0	0	1+	0
51	0	0	0	0	0	3+	0	0
52	0	0	0	0	0	0	0	0
56	1+	0	weak	0	0	0	weak	0
58	0	0	1+	1+	0	0	0	0
59	0	1+	0	0	0	0	1+	0
68	0	1+	0	0	0	0	1+	0
70	0	1+	0	0	0	0	3+	0

* Done at high stringency (60°C in 0.2XSSC and 2% bovine serum albumin for 10 min) using tissues/Pap smears known to contain the different HPV types listed in the Table. Concentration of each probe at 500 ng/ml.

Gerard Nuovo, MD
MGN Medical Research Laboratories

TABLE 3.
Low stringency

	Digene probe*	Cocktail 1**	Cocktail 2	Cocktail 3
2	0 (3+ HPV 2)	0	0	0
6/11	1+	0	0	0
6/11	1+	0	0	0
6/11	2+	1+	0	0
6/11	2+	2+	0	0
6/11	3+	2+	1+	weak
6/11	3+	1+	0	0
6/11	3+	3+	0	0
6/11	3+	1+	0	0
6/11	3+	1+	0	0
6/11	1+	0	0	0
6/11	1+	0	0	0
42	2+	-	0	0
43	2+	-	0	0
44	2+	0	0	0
16	3+	1+	3+	1+
16	1+	1+	1+	1+
16	2+	2+	2+	1+
16	weak	1+	1+	1+
16	3+	3+	3+	2+
16	3+	3+	3+	3+
16	3+	3+	3+	3+
16	3+	2+	3+	2+
31	3+	3+	3+	2+
31	3+	3+	3+	3+
33	3+	3+	3+	3+
33	3+	3+	2+	2+
35	2+	3+	3+	3+
35	1+	-	-	1+
51	3+	3+	3+	3+
39	3+	3+	3+	3+
39	3+	3+	3+	3+
39	3+	3+	3+	3+

39	2÷	1+	1÷	1+
39	2÷	2+	2÷	2+
39	1+	weak	weak	weak
39	3+	3+	3+	3+
39	3+	-	3+	3+
39	1+	1÷	1+	1÷
45	3÷	3+	3+	3÷
45	3+	-	3÷	3+
52	3+	3+	3÷	3+
52	3+	3+	3+	3+
52	2÷	2÷	2+	2+
56	3÷	3+	3+	3+
56	1+	1+	1+	1+
56	3+	2+	2÷	1÷
56	3+	2+	1+	1÷
58	2÷	2÷	1÷	1÷
59	2÷	2÷	2+	-
68	1+	-	1+	1+
70	3+	3+	3+	2+
70	2+	ND	2+	-
70	1+	1+	1+	1+
still novel	2+ (31 related)	2+	2+	2+
	1÷ (18 related)	1+	1÷	1+
	1÷ (18 related)	1−	1÷	1÷

* The digene probe is their type specific probe.

** Cocktail 1 has 500 ng/ml of HPV 16, cocktail 2 has 200 ng/ml HPV 16, and cocktail 3 has 100 ng/ml. Each cocktail has 500 ng/ml of HPVs 18,33,35, and 51 plus 200 ng/ml of HPV 31.

Curriculum Vitae
Gerard J. Nuovo, MD

Title and current address

Professor

Dept Pathology
Ohio State University Medical Center

Education

University of Vermont (UVM)	Burlington, Vermont, **BA**, *summa cum laude*
UVM College of Medicine	Burlington, Vermont, **MD** (1983**)**

Postgraduate Positions

Columbia University College of P&S	Resident in Pathology,1983-7; Chief Resident, 1987
Columbia University	Fellow, Gyn Pathology and Molecular Virology,1987-9
Columbia University	Assistant Professor of Pathology,1989-90
SUNY, Stony Brook	Assistant Professor of Pathology and OB/GYN Director-Cytology, 1990-1996
Enzo Clinical Labs	Medical Director, 1996-1999;
OSU Department of Pathology	1999-current: Professor – Anatomic Pathology

Licensure

New York medical license	Number 161708-1
Ohio medical license/UPIN	76400/A61837
DEA license	Number AN 3092070
Board Certified	Anatomic Pathology; June 1987

Editorial review boards (former and present)
Journal Histochemistry and Cytochemistry; Diagnostic Molecular Pathology
Journal of Histotechnology; Frontiers in Biotechnology; Annals Diag Pathology

Inventions/patents

PCR in situ hybridization with Roche Molecular Systems (patent #5,538,871)

Awards

1. LR Jones Award for Basic Research
2. ASCAP award for resident research; 1993
3. ASCAP award for resident research; 1994
4. Third Annual Howard M. Temin Award in Clinical Science for HIV/AIDS.

Section 1: List of publications

1. Wilson DM, Nuovo GJ. Patulin production in apples decayed by Penicillium expansum. Applied Microbiology **1973**,26:124-125.
2. Wilson DM, Nuovo GJ, Darby WB. Activity of o-diphenol oxidase in post-harvest apple decay by Penicillium expansum and Physalospora obtusa. Phytopathol **1973**,63:1115-1118.
3. Nuovo GJ, Nagler HM, Fenoglio JJ. Arteriovenous malformation of the bladder presenting as gross hematuria. Hum Pathol **1986**,17:94-97.
4. Nuovo GJ, Friedman D, Silverstein SJ, Crum CP. Transcription of human papillomavirus type 16 in genital precancers. Cancer Cells (5):Papillomaviruses, Cold Spring Harbor Laboratory **1987**,337-342.
5. Nagai N, Nuovo GJ, Friedman D, Crum CP. Detection of papillomavirus nucleic acids in genital precancers with the *in situ* hybridization technique: a review. Int J Gynecol Pathol **1987,**6: 366-379.
6. Follen MM, Levine RU, Carillo E, Richart RM, Nuovo GJ, Crum CP. Colposcopic correlates of cervical papillomavirus infection. Am J Obstet Gynecol **1987**,157:809-814.
7. Nuovo GJ, Crum CP, Silverstein SJ. Papillomavirus infection of the uterine cervix. Microbiol Pathogen **1987**,3:71-78.
8. Nuovo GJ, Crum CP, DeVilliers EM, Levine RU, Silverstein SJ. The isolation of a novel human papillomavirus (HPV 51) from a cervical condyloma. J Virol **1988**,62:1452-1455.
9. Crum CP, Nuovo GJ, Friedman D, Silverstein SJ. Accumulation of RNA homologous to human papillomavirus type 16 open reading frames in genital precancers. J Virol **1988**,62:84-90.
10. Nuovo GJ, Nuovo MA, Cottral S, Gordon S, Silverstein SJ, Crum CP. Histological correlates of clinically occult human papillomavirus infection of the uterine cervix. Am J Surg Pathol **1988**,12:198-204.
11. Crum CP, Nuovo GJ, Friedman D, Silverstein SJ. A comparison of biotin and isotype labelled RNA probes for *in situ* detection of papillomavirus RNA in genital neoplasms. Lab Invest **1988**,58:354-359.
12. Nuovo GJ, Blanco JB, Silverstein SJ, Crum CP. Histologic correlates of papillomavirus infection of the vagina. Obstet Gynecol **1988**;72:770-774.
13. Nuovo GJ, Silverstein SJ. Comparison of formalin, buffered formalin, and Bouin's fixation on the detection of human papillomavirus DNA extracted from genital lesions. Lab Invest **1988**,59:720-724.
14. Nuovo, GJ. Correlation of histology with human papillomavirus DNA detection in the female genital tract. Gynecol Oncol **1988**,31:176-183.
15. Moy RL, Eliezri Y, Nuovo GJ, Bennett W, Silverstein SJ. Squamous cell carcinoma of the finger is associated with human papillomavirus type 16 DNA. JAMA **1989**,261:2669-2673.

16. Nuovo MA, Nuovo GJ, McCaffrey R, Levine RU, Winkler BA. Atypical endometrial polyps in patients receiving Tamoxifen. Int J Gynecol Pathol **1989**;8:125-131.
17. Nuovo GJ, Cottral S. Occult infection of the uterine cervix by human papillomavirus in postmenopausal women. Am J Obstet Gynecol **1989**,160:340-345.
18. Nuovo GJ. Virilizing stromal thecosis of the ovary associated with multiple corpora atretica. Am J Clin Pathol **1989**,92:505-508.
19. Nuovo GJ. Buffered formalin is the superior fixative for the detection of HPV DNA by *in situ* hybridization analysis. Am J Pathol **1989**,134:837-842.
20. Nuovo GJ. A comparison of slot blot, Southern blot and *in situ* hybridization analyses for human papillomavirus DNA in genital tract lesions. Obstet Gynecol **1989**, 74: 673-678.
21. Nuovo GJ, O'Connell M, Blanco JB, Levine RU, Silverstein SJ. Correlation of histology and human papillomavirus DNA detection in condyloma acuminatum and condyloma-like vulvar lesions. Amer J Surg Pathol **1989**, 13:700-706.
22. Nuovo GJ. A comparison of different *in situ* hybridization methodologies (biotin based and ^{35}S based) for the detection of human papillomavirus DNA. Lab Invest **1989**, 61: 471-476.

23. Nuovo MA, Nuovo GJ, Smith D, Lewis S. Benign mesenchymoma of the round ligament: A report of two cases with immunohistochemistry. Am J Clin Pathol **1990**, 93: 421-424.
24. Nuovo GJ, Friedman D. *In situ* hybridization analysis of HPV DNA segregation patterns in lesions of the female genital tract. Gynecol Oncol **1990**, 36:256-262.
25. Richart RM, Nuovo GJ. HPV-DNA *in situ* hybridization can be used for the quality control of diagnostic biopsies. Obstet Gynecol **1990**, 75:223-226.
26. Nuovo GJ, Pedemonte BA. Human papillomavirus types and recurrent genital warts. JAMA **1990**, 263:1223-1226.
27. Lastarria D, Sachdev RK, Babury RA, Wu H, Nuovo GJ. Immunohistochemical analysis for desmin in normal and neoplastic ovarian stromal tissue. Arch Pathol Lab Med **1990**, 114: 502-505.
28. Eliezri Y, Silverstein SJ, Nuovo GJ. The occurrence of human papillomavirus DNA in cutaneous squamous and basal cell neoplasms. Arch Dermatol **1990**, 23: 836-842**.**
29. Nuovo GJ. HPV DNA in genital tract lesions histologically negative for condylomata: Analyses by *in situ* , Southern blot hybridization and the polymerase chain reaction. Am J Surg Pathol **1990**, 14: 643-651.
30. Nuovo GJ, Blanco JS, Leipzig S, Smith D. Human papillomavirus detection in cervical lesions nondiagnostic for intraepithelial neoplasia: Correlation with Papanicolaou smear, colposcopy, and the occurrence of cervical intraepithelial neoplasia. Obstet Gynecol **1990**, 75: 1006-1011.
31. Sachdev R, Nuovo GJ, Kaplan C, Greco MA. Detection of CMV in chronic placentitis by *in situ* hybridization. Pediatr Pathol **1990**, 10: 909-917.
32. Nuovo GJ, Hochman H, Eliezri YD, Comite S, Lastarria D, Silvers D. Human papillomavirus DNA in penile lesions histologically negative for condylomata:

analysis by in situ hybridization and the polymerase chain reaction. Am J Surg Pathol **1990**, 14: 829-836.

33. Nuovo GJ, Babury R, Calayag P. Human papillomavirus types and recurrent genital warts in immunocompromised women. Mod Pathol **1991**, 4: 632-636.
34. Nuovo GJ, Smith S, Lerner J, Comite S, Eliezri Y. Human papillomavirus segregation patterns in genital and non-genital warts in children and adults. Am J Clin Pathol **1991,** 95: 467-472.
35. Nuovo GJ. Comparison of Bouin's Solution and Buffered Formalin Fixation on the Detection Rate by *in situ* hybridization of Human Papillomavirus DNA in Genital Tract Lesions. J Histotech **1991,** 14:13-17.
36. Nuovo GJ, Darfler M, Impraim C, Bromley S. Infection by multiple types of human papillomavirus in genital tract lesions: Analysis by *in situ* hybridization and the polymerase chain reaction. Am J Pathol **1991**, 58:518-523.
37. Koulos J, Symmans F, Chumas J, Nuovo GJ. Human papillomavirus detection in adenocarcinoma of the anus. Mod Pathol **1991**, 4: 58-61.
38. Nuovo GJ, MacConnell P, Forde A, Delvenne P. Detection of Human Papillomavirus DNA in formalin fixed tissues by in situ hybridization after amplification by the polymerase chain reaction. Am J Pathol **1991**, 139: 847-854.
39. Nuovo GJ, Delvenne P, MacConnell P, Chalas E, Neto C, Mann WJ. Correlation of histology and detection of human papillomavirus DNA in vulvar cancers. Gynecol Oncol **1991**, 43:275-280.
40. Nuovo GJ, Gallery F, MacConnell P, Becker J, Bloch W. An improved technique for the detection of DNA by *in situ* hybridization after PCR-amplification. Am J Pathol **1991**, 139:1239-1244.
41. Nuovo GJ, Walsh LL, Gentile JL, Blanco JS, Koulos J, Heimann A. Correlation of the Papanicolaou smear and human papillomavirus type in women with biopsy proven cervical intraepithelial lesions. Am J Clin Pathol **1991**, 96:544-548.

42. Nuovo GJ. Determination of HPV type by *in situ* hybridization analysis: A comparative study with Southern blot hybridization and the polymerase chain reaction. J Histotech **1992**, 15: 99-104.
43. Hair LS, Nuovo GJ, Powers JM, Sisti MB, Britton CB, Miller JR. Progressive multifocal leukoencephalopathy in patients with human immunodeficiency virus. Hum Pathol **1992**, 23: 663-667.
44. Nuovo GJ, Becker J, MacConnell P, Margiotta M, Comite S, Hochman H. Histological distribution of PCR-amplified HPV 6 and 11 DNA in penile lesions. Amer J Surg Pathol **1992**, 16:269-275.
45. Nuovo GJ, Margiotta M, MacConnell P, Becker J. Rapid *in situ* detection of PCR-amplified HIV-1 DNA. Diagn Mol Pathol **1992**; 1: 98-102.
46. Nuovo GJ, Gorgone G, MacConnell P, Goravic P. *In situ* localization of human and viral cDNAs after PCR-amplification. PCR Method Applic **1992**, 2:117-123.
47. Prezioso PJ, Cangiarella J, Lee M, Nuovo GJ, Borkowsky W, Orlow SJ, Greco MA. Fatal disseminated infection with human herpesvirus-6. J Pediat **1992**; 120:921-923.

48. Nuovo GJ, Gallery F, MacConnell P. Analysis of the distribution pattern of PCR-amplified HPV 6 DNA in vulvar warts by in situ hybridization. Mod Pathol **1992**; 5:444-448.
49. Symmans F, Mechanic L, McConnell P, DaSilva K, Stricker B, Nuovo GJ. Correlation of the Papanicoloau smear in postmenopausal women with Human Papillomavirus detection. Int J Gynecol Pathol **1992**; 11:204-209.
50. Delvenne P, Engellenner W, Ma SF, Mann WJ, Chalas E, Nuovo GJ. Detection of human papillomavirus DNA in biopsy proven cervical intraepithelial lesions in pregnant women. J Repro Med **1992**; 37: 829-833.
51. Heimann A, Scanlon R, Gentile J, MacConnell P, Nuovo GJ. Measles cervicitis: A cytological and molecular biological analysis. Acta Cytol **1992**: 36:727-730.
52. Bradshaw BR, Nuovo GJ, DiCostanzo D, Cohen SR. Human papillomavirus type 16 associated perianal carcinoma in situ and condylomata acuminata in a homosexual male. Arch Dermatol **1992**; 128: 949-952.
53. Nuovo GJ, Moritz J, Walsh LL, MacConnell P, Koulos J. Predictive value of human papillomavirus DNA detection by filter hybridization and PCR in women with indeterminate colposcopic examinations. Amer J Clin Pathol **1992**; 98: 489-492.
54. Nuovo GJ, Moritz J, Anya E, Chalas, E, Kaplan B, Mann W. Human papillomavirus types and recurrent genital warts after conization. Gynecol Oncol **1992**, 46: 304-308.
55. Greco MA, Wieczorek R, Sachdev R, Kaplan C, Nuovo GJ, Demopoulos R. Immunophenotype of villous stromal cells in placentas with cytomegalovirus, syphilis and nonspecific villitis. Am J Pathol **1992;** 141: 835-842.

56. Brandwein M, Nuovo GJ, Biller H. Analysis of laryngeal carcinomas for human papillomavirus using consensus primers and the hot start polymerase chain reaction. Ann Otolaryngol, Rhinol, Laryngol **1993**; 102: 309-313.
57. Delvenne P, Margiotta M, Nuovo GJ. Comparison of *in situ* hybridization and immunohistochemistry for the detection of Cytomegalovirus infection. J Histotech **1993;** 16:27-31.
58. Nuovo MA, Nuovo GJ, MacConnell P, Steiner G. Analysis of Paget's disease of bone for the measles virus using the reverse transcriptase in situ polymerase chain reaction technique. Diag Mol Pathol **1993**; 1: 256-265.
59. Nuovo GJ, Lidonocci K, MacConnell P, Lane B. Intracellular localization of PCR-amplified hepatitis C cDNA. Am J Pathol **1993**; 17: 683-690.
60. Nuovo GJ, Gallery F, Hom R, MacConnell P, Bloch W. Importance of different variables for optimizing in situ detection of PCR-amplified DNA. PCR Method Applic **1993**, 2: 305-312.
61. Nuovo GJ, Forde A, MacConnell P, Fahrenwald R. In situ detection of PCR-amplified HIV-1 nucleic acids and tumor necrosis factor cDNA in cervical tissues. Am J Pathol **1993**; 143: 40-48.
62. Ferguson FS, Archard H, Nuovo GJ, Nachman S. Hairy leukoplakia in a child with AIDS. Ped Dentistry **1993** 15:280-282.

63. Nuovo MA, Nuovo GJ, Becker J, Gallery F, Kane P. Correlation of coincident viral infection and mortality in patients with Pneumocystis pneumonia: An analysis by in situ hybridization and PCR. Diagn Mol Pathol **1993;** 2: 200-209.

64. Nuovo GJ, Gallery F, MacConnell P, Braun A. *In situ* detection of PCR-amplified HIV-1 nucleic acids and tumor necrosis factor RNA in the central nervous system. Am J Pathol **1994**; 144: 659-666.
65. Seidman R, Peress N, Nuovo GJ. In situ detection of PCR-amplified HIV-1 nucleic acids in skeletal muscle in patients with myopathy. Mod Pathol **1994**; 7: 369-375.
66. Nuovo GJ, Becker J, Margiotta M, Burke M, Fuhrer J, Steigbigel R. In situ detection of PCR-amplified HIV-1 nucleic acids in lymph nodes and peripheral blood in asymptomatic infection and advanced stage AIDS. J Acquired Immun Def 7: 916-923, **1994**.
67. Kelleher MB, Duggan TD, Galutira D, Nuovo GJ, Haegert G. Progressive multifocal leukoencephalopathy in a patient with Alzheimer's dementia. Diag Mol Pathol **1994**; 3: 105-113.
68. Nuovo GJ, Becker J, Simsir A, Margiotta M, Shevchuck M. *In situ* localization of PCR-amplified HIV-1 nucleic acids in the male genital tract. Am J Pathol **1994**; 144:1142-1148.
69. French DL, Ramos-DeSimone N, Rozinski K, Nuovo GJ. Matrix metalloprotease-9 in tumor cell invasion. Annals New York Acad Sci 732:324-34 (**1994).**
70. Brandwein M, Zeitln J, Nuovo GJ, MacConnell P, Bodian C, Urken M, Biller H. HPV detection using hot start polymerase chain reaction in patients with oral cancer. A clinicopathologic study of 64 patients. Mod Pathol, **1994**, 7:720-727.
71. Nuovo GJ, Gallery F, MacConnell P. Analysis of non-specific DNA synthesis during in situ PCR. PCR Meth Applic 4: 342-349, **1994**.
72. Cheng J, Nuovo GJ. The utility of RT in situ PCR in the diagnosis of viral infections. J Histotech, **1994**, 17: 247-251.

73. Nuovo GJ. A comparison of subgenomic and genomic DNA probes for detection and typing of human papillomavirus by *in situ* hybridization. J Histotech **1995**; 18: 105-110.
74. Brannagan TH. Nuovo GJ, Hays A. HIV infection of dorsal root ganglion neurons detected by polymerase chain reaction in situ hybridization. Ann Neurol **1997**, 42: 368-72.
75. Nuovo GJ. The utility of PCR in situ hybridization for the detection of HIV-1 DNA and RNA. Plenum Press **1995**; 268-279.
76 Lidonnici K, Lane B, Nuovo GJ. A comparison of serologic analysis and *in situ* localization of PCR-amplified cDNA for the diagnosis of hepatitis C infection. Diagn Mol Pathol 4: 98-107, **1995**.

77. Weidenheim KM, Bodhireddy SR, Nuovo GJ, Nelson SJ, Dickson DW. Multicystic encephalopathy: Review of eight cases with etiologic considerations. Neuropathol 54: 268-275, **1995**.
78. Chow LH, Bubramanian S, Nuovo GJ, Miller F, Nord EP. Endothelial receptor expression in the renal medulla identified by in situ RT PCR. Am J Physiol **1995**, 269: 449-457.
79. Nuovo GJ, MacConnell P, Valea F, French DL. Correlation of the in situ detection of PCR-amplified metalloprotease cDNAs and their inhibitors with prognosis in cervical carcinoma. Cancer Research, **1995**, 55: 267-275.
80. Gruber BL, Sorbi D, French DL, Marchese MJ, Nuovo GJ, Arbeit LA. Elevated circulating MMP-9 (gelatinase B) in rheumatoid arthritis. Clin Immunol Immunopathol **1996** Feb 78(2):161-71

81. Dubrovsky L, Ulrich P, Nuovo GJ, Manogue KR, Cerami A, Burkinsky M. Nuclear localization signal of HIV-1 as a novel target for therapeutic intervention. Molecul Med 1: 217-230, **1995.**
82. Margiotta M, Forde A, Nuovo GJ. Comparison of different detection kits for in situ hybridization. J Histotech **1996**; 19: 139-142**.**
83. Brandwein M, Biller H, Nuovo GJ. Histologic distribution of EBV DNA in hairy leukoplakia: A study by in situ PCR. Mod Pathol **1996**, 9:298-303.
84. Nuovo GJ, Preissner M, Bronson R. Vitronectin expression in the male genital tract. Molecul Human Repro **1995**, 10: 2187-2191.
85. Yoo BJ, Selby MJ, Choe J, Suh BS, Choi SH, Joh JS, Nuovo GJ, Lee H, Houghton M, Han JH. Transfection of a differentiated human hepatoma cell line (Huh7) with in vitro transcribed hepatitis C Virus (HCV) RNA and establishment of a long term culture persistently infected with HCV. J Virol **1995**; 69: 32-38.
86. Nuovo GJ, Forde A. An improved system for reverse transcriptase in situ PCR. J Histotech **1995**, 18: 295-299.

87. Galanakis D, Nuovo GJ, Spitzer S, Kaplan C. Demonstration of fibrinogen mRNA in human trophoblasts by reverse transcriptase PCR in situ. Thrombosis Res **1996**, 81: 263-269.
88. Nuovo GJ, Simsir A, Steigbigel R, Kuschner M. Rapid detection of hantavirus infection in tissue sections by reverse transcriptase in situ PCR. Am J Pathol **1996**, 148: 685-692.
89. Schmidtmayerova H, Notte HS, Nuovo GJ, Raabe T, Flanagan CR, Dubrovsky L, Gendelman HE, Cerami A, Bukrinsky M, Sherry B. HIV-1 infection alters chemokine ß peptide expression in human monocytes: Implications for recruitment of leukocytes into brain and lymph nodes. Proc Natl Acad Sci, USA, **1996,** 93:700-4.
90. McHugh RW, Hazen P, Eliezri Y, Nuovo GJ. Human papillomavirus type 35 DNA in a periungual squamous cell carcinoma and axillary lymph node metastases. Arch Dermatol **1996.**

91. Sorbi D, French D, Nuovo GJ, Arbeit LA, Gruber BL. Eleveated 92kDa type IV collagenase (MMP-9) levels in giant cell arteritis. Arthritis and Rheumat **1996** : 39: 1747-53.
92. Nuovo GJ, Alfieri ML. AIDS dementia is associated with massive, activated HIV-1 infection and concomitant expression of several cytokines. Molecular Med **1996**, 2: 358-66.
93. April MM, Garelick JM, Nuovo GJ. Reverse transcriptase in situ polymerase chain reaction in atypical mycobacterial adenitis. Arch Otolaryngol Head Neck Surg. **1996,** 122: 1214-8.

94. Nuovo GJ. In situ detection of PCR-amplified metalloprotease cDNAs, their inhibitors, and human papillomavirus transcripts in cervical carcinoma cell lines. Int J Cancer **1997**, 71: 1056-60.
95. Wieder K, Chatis P, Boltax J, Wieder I, Nuovo GJ, Stromm T. Human immunodeficiency virus -1 entry into mouse cells through a mutant murine CD4 receptor. J Exp Med **1997**.
96. Becker J, Nuovo GJ. In situ detection of PCR-amplified Ebstein Barr Virus and human immunodefieciency virus type 1 nucleic acids in hyperplastic lymph nodes and lymphomas. J Histochem Cytochem **1997**,
97. Navarro M, Furlani B, Nuovo GJ. Cytologic correlates of benign versus dysplastic abnormal keratinization. Diagn Cytopath **1997**, 17: 447-51.
98. Steinman CR, Muralidhar G, Nuovo GJ, Yu D, Mukai. Domain directed PCR capable of distinguishing bacterial from host DNA at the single cell level: characterization of a systematic method to investigate putative bacterial infection in idiopathic disease. Analytical Biochem **1997**, 244: 328-39.
99. Gnatenko D, Muzyczka N, Zolotukhin S, Nuovo GJ, Bahou W. Adeno-associated virus-2 as a vehicle for gene delivery into vascular cells: evidence for direct systemic delivery into rat endothelial cells in vivo. J Invest Med **1997**, 45: 87-98.
100. Liu D, Donegan J, Nuovo G, Mitra D, Lawrence J. Stable HIV-1 resistance in transformed CD4+ monocytic cells treated with multitargeting HIV-1 antisense sequences incorporated into U1 snRNA. J Virol **1997**; 71: 4079-85.
101. Sivaraman V, Wang H, Nuovo GJ, Malbon, C.C. Hyperexpression of mitogen-activated protein kinase in human breast cancer. J Clin Invest **1997**, 99: 1478-83.

102. Schmidtmayerova H, Nuovo GJ, Bukrinsky M. Human immunodeficiency virus type 1 T-lymphotropic strains enter macrophages via a CD4 ad CXCR4- mediated pathway: replication is restricted at a postentry level. J Virol **1998**; 72: 4633-42.
103. Shevchuk MM, Nuovo GJ, Khalife G. HIV in the testis: quantitative histolog and HIV localization in germ cells. J Repro Immunol **1998**: 41: 69-79.
104. Simsir A, Greenbaum E, Schulman LL, Nuovo GJ. Late fatal adenovirus pneumonia in a lung transplant recipient. Transplant **1998**, 65: 592-4.
105. Nuovo GJ. Histologic distribution of hepatitis A,B,C,D,E and G with the concomitant cytokine response in liver tissues. Diag Molecul Pathol **1998**, 7: 267-75.

106. Nuovo GJ. Detection of human papillomavirus DNA in Papanicolaou smears: Correlation with pathologic and clinical findings. Diag Molec Pathol **1999**, 7: 158-63.
107. Nuovo GJ, Baylin SB, Bolinsky S, Herman JG, Plaia, T. In situ detection of the hypermethylation-induced inactivation of the p16 gene as an early event in oncogenesis. Proc Natl Acad Sci USA **1999**, 96: 12754-9.
108. Becker JL, Nuovo GJ, Josepovitz C, Miller F, Nord EP. Epstein-Barr virus infection of renal proximal tubule cells: possible role in chronic interstitial nephritis. J Clin Invest **1999**; 104: 1673-81.
109. Michael EJ, Husain S, Zalar G, Nuovo GJ. Focal epithelial hyperplasia in an Ecuadorian girl. Cutis **1999**, 64: 395-6.
110. Nuovo GJ, Hohman RJ, Nardone GA, I.A. Nazarenko. In situ amplification using universal energy transfer labeled primers. J Histochem Cytochem **1999**, 47: 273-9.

111. Nuovo GJ, Reid, R. In situ strand displacement amplification: An improved technique for the detection of low copy nucleic acids. Diag Molecul Pathol, **2000** 9: 195-202.
112. Sambiase NV, Higuchi ML, Nuovo GJ, Gutierrez PS, Uip DE, Ramires JA. CMV and transplant-related coronary atherosclerosis: an immunohistochemical, in situ hybridization, and PCR in situ study. Mod Pathol **2000**, 13: 173-9.
113. Nuovo GJ, Ishag M. The histologic spectrum of epidermodysplasia verruciformis. Am J Surg Pathol **2000**, 24: 1400-06.
114. Nahman NS, Sferra TJ, Urban KE, Nuovo GJ, Sedmak DD. Microsphere-adenoviral complexes target and transduce the glomerulus in vivo. Kid International **2000**, 58: 1500-10.

115. Morrison C, Gilson T, Nuovo GJ. Histologic correlates of fatal rotaviral infection. Human Pathol **2001**, 32: 216-21.
116. Nuovo MA, Nuovo GJ. In situ detection of PCR amplified human herpes virus type 8 in Kaposi's sarcoma and its mimics.J Cutaneous Pathol **2001**, 28: 248-55.
117. Nuovo GJ, Morrison C, Porcu P, Caliguri M, Suster S. *In situ* determination of T cell receptor beta expression patterns: methodology and clinical utility. J Histochem Cytochem **2001**, 49: 139-145.
118. Morrison C, Porcu P, Caliguri M, Nuovo GJ. *In situ* determination of *In situ* determination of B cell heavy chain and kappa/lambda light chain expression patterns: methodology and clinical utility. Diagn Molec Pathol **2001,** 10: 171-8**.**
119. Stein S, Carston G, Nuovo GJ, and Steinberg S. Retroperitoneal liposarcoma presenting as an incarcerated inguinal hernia. Surgical Rounds **2001** 52: 506-11.
120. Morrison C, Catania F, Wakely P, Nuovo GJ. Highly keratinizing squamous cell cancer of the cervix: a rare, locally aggressive tumor not associated with human papillomavirus or squamous intraepithelial lesions. Am J Surg Path **2001,** 25: 1310-5.
121. Menezes G, Wakely P, Nuovo GJ. INCREASED INCIDENCE OF ATYPICAL PAPANICOLAOU SMEARS FROM THINPREPS™ OF POST MENOPAUSAL

WOMEN ON HORMONE REPLACEMENT THERAPY Cancer Cytopathol **2001** 93: 357-63.

122. Nakagawa H, Nuovo GJ, Zervos EE, Martin EW, Aaltonen LA, delaChapelle A. Age-related hypermethylation of MLH1 5' region in normal colonic mucosa is associated with microsatellite-unstable colorectal cancer development. Cancer Res **2001**, 61: 6991-5.
123. Euscher E, Davis J, Holtzman I, Nuovo GJ. Coxsackie virus infection of the placenta associated with neurodevelopmental delays in the newborn. Obstet Gynecol 2001, 98: 1019-26.
124. Naarendorp M, Kallemuchikkal U, Nuovo GJ, Gorevic PD. Longterm efficacy of interferon-a for extrahepatic disease associated with hepatitis C infection. J Rheumatol, **2001** 28: 2466-2473.
125. Menezes G, Euscher E, Nuovo GJ. Utility of the in situ detection of human papilloma virus in Papanicolaou smears diagnosed as within normal limits. Acta Cytologica **2001** 45: 919-926.
126. Bhatt UY, Sferra TJ, Johnson A, Williams C, Nuovo GJ, Nahman NS. Glomerular mRNA expression of a beta-galactosidase transgene following in vivo kidney transduction using microsphere-adenoviral complexes. Kidney International **2001** 58(4):1500-10

127. Nuovo GJ. Diagnosis of human papillomavirus using in situ hybridization and in situ polymerase chain reaction. Methods Mol Biol **2002** 179:113-36
128. Nuovo GJ, Holly A, Wakely P, Frankel W. Correlation of histology, viral load, and in situ viral detection in hepatic biopsies from patients with liver transplants secondary to hepatitis C infection. Human Pathol **2002**, 33: 277-284.
129. Magro C, Nuovo GJ. Parvoviral infection of endothelial cells – possible role in collagen vascular disease. J Rheumatol **2002** 29: 1227-35.
130. Scott IU, Karp CL, Nuovo GJ. Human papillomavirus 16 and 18 expression in conjunctival intraepithelial neoplasia. Ophthalmology **2002**; 109:542-547.
131. Kurooka M, Nuovo GJ, Caligiuri M, Nabel G. Cellular localization and function of Fas ligand (CD95L) in tumors. Cancer Research **2002**, 62: 1261-5.
132. Cioc AM, Daniel D. Sedmak, Gerard J. Nuovo' Magdy R. Dawood, Gerry Smart, Cynthia M. Magro. PARVOVIRUS B19 ASSOCIATED ADULT HENOCH SCHÖNLEIN PURPURA, J Cut Path Nov) 29(10):602-**2002**.
133. Morrison C, Nuovo GJ, Frankel W. Her 2 neu (Cerb B2) is neither over-expressed nor amplified in hepatic neoplasms" Applied Immunohistochemistry and Molecular Morphology **2002**, 10 (3): 237-241.
134. Cioc A, Nuovo GJ. Correlation of viral detection with histology in cardiac tissue from patients with sudden, unexpected death. Mod Pathol **2002 15: 914-22.**
135. Morrison C, Eliezri Y, Magro C, Nuovo GJ. The histologic spectrum of epidermodysplasia verruciformis in transplant and AIDS patients.J Cutan Pathol **2002** 29: 480-9.
136. Nuovo GJ, Owor G, Andrew T, Magro C. Histologic distribution of fatal rotaviral pneumonitis: an immunohistochemical and RT in situ study. Diag Molecular Pathol **2002** 11: 140-145.

137. Porcu P, Eisenbeis CF, Pelletier RP, Davis EA, Baiocchi R, Nuovo GJ, Ferketich A, Henry M, Ferguson RM, Caligiuri M. Successful treatment of post-transplant lymphoproliferative disorder (PTLD) following renal allografting is associated with sustained CD8+ T-cell restoration. Blood **2002** 100: 2341-8
138. Wakely P, Menezes G, Nuovo GJ. MOLECULAR AND CYTOLOGIC CORRELATES OF PRIMARY EFFUSION LYMPHOMA. Mod Pathol Sep 15(9):944-50 **2002**.
139. Cioc A, Nuovo GJ. EXPRESSION OF μ BCR-ABL TRANSCRIPTS IN CHRONIC NEUTROPHILIC LEUKEMIA. Am J Clin Pathol Dec 118(6):842-7, **2002**
140. Hahm GK, Nuovo GJ, Pellegrini AE, Vadmal MS. Eosinophilic nuclear inclusions in a melanocytic nevus. Cutis **2002** 69: 223-6.

141. Morrison C, Wakely P, Nuovo GJ. Oral contraceptive pills are associated with artifacts in ThinPrep™ Pap smears that mimic low grade SILs**.** Cancer Cytopath **2003**; 99: 75-82.
142. Magro CM, Nuovo GJ, Crowson AN. Automated detection of kappa and lambda mRNA expression for the assessment of B cell clonality in cutaneous B cell infiltrates: its utility and diagnostic application. J Cutan Pathol **2003**, 30: 504-11.
143. Fahy RJ, McKeegan CB, Nuovo GJ, Lichtenberger F, Wewers MD. The acute respiratory distress syndrome (ARDS): A possible role for TGF-beta 1. Am J of Respir Cell and Molecular biology 28: 499-503, **2003**
144. Euscher E, Nuovo GJ. Detection of Kappa and Lambda Expressing Cells in the Endometrium by In situ Hybridization. Int J Gynecol Pathol **2003**, 21: 383-390.
145. Andersen M, Nuovo GJ, Allen C. Human papillomavirus, type 40-associated papilloma, and concurrent Kaposi's sarcoma involving the anterior hard palate" to Oral Surg, Oral Med, Oral Pathol, Oral Radiol Endod. **2003,** 95: 80-4
146. Crowson A, Nuovo GJ, Magro C. The dermatopathological manifestations of hepatitis C infection: a clinical, histologic and molecular assessment of 35 cases. Human Pathol **2003**, 34: 573-9.
147. Anderson M, Gomez D, Miles L, Allen C, Nuovo GJ. Correlation of HPV detection by in situ hybridization and histology in oral papillary lesions clinically suspicious for condyloma. Oral Surg Oral Med Oral Pathol Oral Radiol Endod **2003** 96(4):420-8.
148. Guangming G, Barth RE, Nuovo GJ, Magro CM. Kaposi's sarcoma with extensive pulmonary involvement in a patient with AIDS. Chin J Pathol (**in press).**
149. Fehniger TA, Megan A. Cooper, Gerard J. Nuovo, Marina Cella, Fabio Facchetti, Marco Colonna, Michael A. Caligiuri CD56^{bright} Natural Killer Cells are Present in Human Lymph Nodes and are Activated by T cell Derived IL-2: a Potential New Link between Adaptive and Innate Immunity. Blood **2003**, 101: 3052-7.
150. Roychowdhury S, Baiocchi RA, Peng R, Bhatt D, Eisenbeis CF, Nuovo GJ, Barth R, Porcu P, Caligiuri MA. Low dose radiation enhances anti-viral treatment of established Epstein-Barr virus (EBV) –associated primary central nervous system lymphoma. Cancer Research **2003**, 63: 965-71.

151. Nuovo GJ, Magro C. Rapid diagnosis of smallpox and differentiation from its mimics. Diag Mol Path **2003**, 12: 103-7.
152. Holst CR, Nuovo GJ, Chew K, Baylin S, Herman JG, Cha I, Tlsty T. In vivo methylation of p16 promoter sequences in normal mammary epithelium. Cancer Research **2003** 63: 1596-601.
153. Magro CM, Nuovo GJ, Crowson AN. A comparative study between TCR gamma single stranded DNA polymorphism conformational assay versus TCR beta mRNA in situ detection in the diagnostic assessment of cutaneous T cell infiltrates. **2003**, Diagn Molec Pathol 12: 133-41.
154. Crowson AN, Mihm MC, Nuovo GJ, Magro C. Cutaneous manifestations of Crohn's disease, its spectrum, and its pathogenesis: Intracellular consensus bacterial 16S rRNA is associated with the gastrointestinal but not the cutaneous manifestations. Human Path **2003**, 34: 1185-91

155. Cioc A, Nuovo GJ, Allen C, Kalmar J, Suster S. ORAL PLASMABLASTIC LYMPHOMAS IN AIDS PATIENTS ARE ASSOCIATED WITH HUMAN HERPESVIRUS 8. Am J Surg Path **2004**, 28: 41-5.
156. Plaza J, Ramirez N, Nuovo GJ. Utility of HPV analysis for evaluation of possible metastatic disease in women with cervical cancer. Int J Gynecol Pathol, **2004**, 23: 7-12
157. Genen L, Nuovo GJ, Krilov L, Davis JM. CORRELATION OF IN SITU DETECTION OF INFECTIOUS AGENTS IN THE PLACENTA WITH NEONATAL OUTCOME. Journal of Pediatrics **2004**, 144: 316-20.
158. Kim G, Nuovo GJ, Thomas A. Colonic ulcers associated with polyoma virus (BK virus) following cadaveric renal transplantation. Clin Gastroenterol and Hepatol, **2004**: 2: 175-77.
159. Ruhoy SM, Thomas D, Nuovo GJ Multiple inverted follicular keratoses as a presenting sign of Cowden's syndrome: case report with human papillomavirus studies. In: J Am Acad Dermatol (**2004** Sep) 51(3):411-5
160. Satoskar A, Ramirez N, Davis J, Bartholomew D, Nuovo GJ,. Histologic correlates of viral and bacterial infection of the placenta associated with severe morbidity and mortality in the newborn. Human Path **2004**, 35: 536-45.
161. **Cosio, F, Nuovo M, Porcu P, Caliguiri M, Pelletier R, Nuovo GJ.** KIDNEY ALLOGRAFT INFECTION WITH EPSTEIN-BARR VIRUS IS HIGHLY CORRELATED WITH POST-TRANSPLANT LYMPHOPROLIFERATIVE DISORDER. Am J Transplantation **2004**, 4: 116-123.
162. Magro C, Nuovo GJ, Ferri C, Crowson AN. Parvoviral infection of endothelial cells ans stromal fibroblasts: A possible pathogenetic role in scleroderma. J Cutaneous Path **2004**, 31: 43-50 .
163. Kocak E, Abdessalama S, Walker MJ, Nuovo GJ, Kissel, JT. Stiff-person syndrome: A rare presentation for breast cancer. The Breast Journal, **2004**: 10: 552-3.
164. Lee L, Cioc A and Nuovo GJ. The utility of automated light chain analysis on fine needle aspiration material for the diagnosis of lymphoma. Cell Morph **2004**: 12: 252-8.

165. Magro CM, Porcu P, Ahmad N, Crowson AN, Nuovo GJ. Cutaneous immunocytoma: a clinical, histologic, and phenotypic study of 11 cases. Appl Immunohistochem Mol Morph **2004**: 12: 216-24.

166. Nicol AF, Fernandes ATG, Grinsztejn B, Lala e Silva JR, Tristao A, Perez MA, Nuovo GJ, Bonecini-Almeida M. Distribution of immune cell subsets and cytokine producing cells in the uterine cervix of HPV infected women: Influence of HIV-1 co-infection. **2005**. Diag Molec Pathol, 14: 39-47.
167. Verma S, Nuovo GJ, Porcu P, Magro C,. Primary cutaneous EBV-associated B cell lymphoma in the Setting of Iatrogenic Immune Dysegulation. J Cutan Pathol **2005**: 32: 474-483.
168. Nuovo GJ, DeFaria D, Chanona-Vilchi J, Zhang Y. Molecular detection of rabies encephalitis and correlation with cytokine expression. Modern Pathol **2005**: 18: 62-67
169. Yearsley MM, Diaz PT, Knoell D, Nuovo GJ. Correlation of HIV-1 detection and histology in AIDS associated emphysema. Diag Molecul Pathol **2005**, 14: 48-52
170. Plaza J, Nuovo GJ. Histologic correlates of fatal measles infection in children. Diag Mol Path **2005**, 14: 97-102.
171. Tamila Kindwall-Keller, Gregory Otterson, Donn Young, Chris Rhoades, Michael Stanek, Anterpreet Neki, Tamara Criswell, Gerard Nuovo, Richie Soong, Robert Diasio and Miguel A. Villalona-Calero. Phase II Evaluation of Docetaxel and Capecitabine in Previously Treated PATIENTS WITH Non-Small Cell Lung Cancer. CLINICAL CANCER RESEARCH **2005**: 11: 1870-6.
172. Freud AG, Brian Becknell, Sameek Roychowdhury, Hsiaoyin C. Mao, Amy K. Ferketich, Gerard J. Nuovo, Tiffany L. Hughes, Trent B. Marburger, John Sung, Robert A. Baiocchi, Martin Guimond, and Michael A. Caligiuri. A novel human CD34(+) subset resides in lymph nodes and differentiates into $CD56^{bright}$ natural killer cells. Immunity **2005**: 22: 295-304.
173. Verma S Nuovo GJ Porcu P Baiocchi RA Crowson AN Magro CM Epstein-Barr virus- and human herpesvirus 8-associated primary cutaneous plasmablastic lymphoma in the setting of renal transplantation. J Cutan Path **2005**: 32: 35-39.
174. Nuovo GJ, Cooper LD, Bartholomew D. Histologic, infectious, and molecular correlates of spontaneous abortion and perinatal mortality. Diag Molec Path **2005**: 14: 152-8.
175. Sharma G, Dehart J, Nuovo GJ. Correlation of histology, human papillomavirus, and viral load in laryngeal papillomas of childhood. **2005** Diag Mol Pathol 14: 230-6.
176. Rawal RB, Nuovo GJ, Porcu P, Biacchoi R, Magro C. The absence of CD20 mRNA in recurrent cutaneous B cell lymphomas following rituximab therapy. J Cutaneous Pathol **2005**; 32: 616-621.

177. Nuovo GJ. The surgical and cytopathology of viral infections: utility of immunohistochemistry, in situ hybridization, and in situ polymerase chain reaction amplification. Annals Diag Pathology **2006**; 10: 117-131. www.sciencedirect.com.

178. Roda JM, Robin Parihar, Cynthia Magro, Gerard J. Nuovo, Susheela Tridandapani, and William E. Carson, III. NK CELLS PRODUCE T CELL-RECRUITING CHEMOKINES IN RESPONSE TO ANTIBODY-COATED TUMOR CELLS. Cancer Research **2006;** 66: 517-26**.**
179. Nuovo GJ. The utility of immunohistochemistry and in situ hybridization in placental pathology. Arch Path Lab Med **2006**; .
180. Nuovo GJ, Nakagawa H, Sootaama K, delaChapelle A. Hypermethylation of the *MLH1* promoter with concomitant absence of transcript and protein occurs in small foci of crypt cells in unaffected mucosa from sporadic colorectal carcinoma. Diag Mol Pathol **2006**; 15: 17-23.
181. Van Deusen JB, Shah MH, Becknell B, Fehringer TA, Cooper MA, Blaser BW, Ferketich AK, Nuovo GJ, Durbin J, Caligiuri MA. STAT-1 mediated repression of monocyte IL-10 gene expression in vivo. Eur J Immunol **2006**; 36: 623-30.
182. Magro CM, Wusirika R, Frambach GE, Nuovo GJ, Ferri C, Ross P. Autoimmune-like pulmonary disease in association with parvovirus B19: A clinical, morphologic, and molecular study of 12 cases. Appl Immunohistochem Mol Morphol **2006**; 14: 208-16.

183. Nicol A, Nuovo GJ, Wang Y, Grinztejn B, Tristao A, Russomano F, Perez MA, Lapa e Silva JR, Fernandes ATG, Gage J, Martinez-Maza O, Bonecini-Almeida MG. In situ detection of SOCS and cytokine expression in the uterine cervix from HIV/HPV co-infected women. **2006** (in press) Experimental and Molecular Pathology.
184. Marquart J, Trakimas C, Sawchuck WS, Nuovo GJ, deVilliers EM, Turiansky GW. HPV 57 induced extensive, recalcitrant cutaneous verruca vulgaris (**in press**). Journal of the American Academy of Dermatology
185. Fabiane Carvalho de Macedo, Alcina F. Nicol, Martha Yearsley, Andrea Rodrigues Cordovil P, Nuovo GJ. Histologic, viral, and molecular correlates of dengue fever infection of the liver using highly sensitive immunohistochemistry. Diagnostic Molecular Pathology (**in press**).

186. Jiang L, Malpica A, Deavers M, Nuovo GJ, Merino M, Silva EG. Endometrial endometrioid adenocarcinoma involving the cervix: one tumor or two independent tumors? (submitted for publication).
187. Hu W, Nuovo GJ, Willen M, Somach S. Epidermodysplasia verruciformis in two half brothers with HIV infection. (submitted for publication). J Am Acad Dermatol
188. Yin Wang, Yan Liu, Cindy Wu, Huiming Zhang, Xincheng Zheng, Zhi Zheng, Terrence L. Geiger, Gerard J. Nuovo, Yang Liu and Pan Zheng. Laforin is a specific phosphatase for glycogen synthase kinase-3β and suppresses tumor growth in immune-compromised host by inhibiting Wnt signaling. Cell (submitted for publication).
189. Wah Cheuk, John K.C. Chan, G. Nuovo, May K.M. Chan, Manson M.S. Fok. Regression of gastric large B-cell lymphoma accompanied by a florid lymphoma-like T-cell reaction: immunomodulatory effect of *Ganoderma lucidum (Lingzhi)*?. Am J Surg Pathol (submitted).

190. Liuyan Jiang, Anais Malpica., Michael Deavers., Gerard Nuovo., Maria Merino, Elvio G. Silva. Endometrial endometrioid adenocarcinoma involving the cervix: One tumor or two independent tumors? (submitted)
191. Lee, E.J., Gusev, Y., Jiang, J., Nuovo, G.J., Lerner, M.R., Frankel, W.L., Morgan, D.L., Postier, R.G., Brackett, D.J., Schmittgen, T.D. Expression profiling identifies distinct microRNA signature in pancreatic cancer. Int J Cancer (submitted).
192. Aguilera-Barrantes I, Magro CM, Nuovo GJ. Verruca vulgaris of the vulva in children and adults: a non-venereal type of vulvar wart. Am J Surg Pathol (submitted).

Curriculum Vitae
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Section 2: List of invited chapters

1. Crum CP, Friedman D, Nuovo GJ, Silverstein SJ. Morphological correlates of genital human papillomavirus infection: Viral replication, transcription and gene expression. In: Gallo R, Hazeltine W, Klein G, ZurHausen H, eds. Viruses and Human cancer. **1986**, New York, Alan R. Liss:355-369.
2. Crum CP, Nuovo GJ. The cervix. In: Diagnostic Surgical Pathology. Sternberg SS, ed. New York, Raven Press **1989**,1557-1589.
3. Nuovo GJ. Molecular/morphologic correlation of human papillomavirus infection. In: Clinical practice of Gynecology. Winkler, B, Richart RM eds. Elsevier Science Publishing Company, Inc. **1989**, 297-313.
4. Nuovo GJ, Richart RM. Human papillomavirus: A review. In: Yearbook of Obstetrics and Gynecology **1989**. Mishell DR, Kirschbaum TH, Morrow CP,eds. Chicago, Year Book Medical Publishers Inc, **1989**, 297-313.
5. Crum CP, Nuovo GJ. The cervix. In: Surgical Pathology of the female reproductive system and peritoneum. Sternberg SS, Mills SE, eds. New York, Raven Press **1990.**
6. Nuovo GJ, Crum CP. Papillomaviruses and cervical neoplasia. In: Clinical Perspectives in Obstetrics and Gynceology, Altchek A, Deligdisch L, eds Springe-Verlag, New York **1991**, 39-54.
7. Nuovo GJ, Nuovo JH. Is clinical testing for human papillomavirus indicated? J Fam Pract **1991** 32:183-191.
8. Nuovo GJ. PCR in situ hybridization. In: Clinical Immunol Newsletter. Landay AL, Homburger HA, eds, Elsevier Science Publishing Co. **1992**, 12: 106-112.
9. Nuovo GJ. Human Papillomavirus. In: Benign to malignant progression in cervical squamous and glandular epithelium: histology, cytology, and papillomavirus effect. Ehrmann R, ed. Igaku-Shoin Medical Publishers, New York **1993.**
10. Nuovo GJ. In situ hybridization protocols. In: Methods in Molecular Biology., ed. Choo, K.H.A. Humana Press, Inc. **1993.**
11. Nuovo GJ, Becker J. PCR in situ hybridization for viral detection. In: PCR Applications in Pathology, Latchman DS, ed., Oxford University Press, London, **1994.**
12. Nuovo GJ. The in situ detection of PCR amplified DNA and cDNA: A review. J Histotechnology **1994**, 17: 252-263.
13. Nuovo GJ. In situ detection of DNA after polymerase chain reaction amplification. In: Cell Biology: A laboratory handbook. Celis JE, ed. , Orlando, Florida, Academic Press Inc. **1994**, 477-487.
14. MacConnell P, Nuovo GJ. RT in situ PCR for the detection of viral RNA and mRNAs. In: Reverse transcriptase PCR, Siebert PD, Larrick JW, , eds, Academic Press Inc. **1994.**

15. Nuovo GJ. Current concepts in pathologic diagnoses: Viral diseases. J Histotech special issue: Pathology of infectious diseases. **1995**, 18.
16. Nuovo GJ. PCR in situ hybridization. In: Molecular Methods for Viral Detection, Wiedbrauk DL, Farkas DH, eds, Academic Press Inc, **1995**, Chapter 11, 237-259.
17. Simsir S, Nuovo GJ. PCR and RT PCR *in situ* hybridization: applications in viral detection. Trends in Biotechnology, Robinson C, ed, Elsevier, London, **1995**.
18. Nuovo GJ. In situ hybridization. In: Anderson's Textbook of Pathology, 10th Edition. Damjanov I, Linder J, eds. Academic Press Inc. **1995**.
19. Nuovo GJ. Human papillomaviruses is recurrent cervical intraepithelial neoplasia. Contemporary OB/Gyn, **1995**, 40: 9-19.
20. Nuovo GJ. The clinical utility of detection of human papillomavirus DNA in the lower genital tract. Infections in Medicine **1995**, 11: 172-183.
21. Nuovo GJ. In situ PCR: Protocols and Applications. PCR Meth Applic, **1995**: S141-S167.
22. Nuovo GJ. Molecular diagnostics in pathology: Utility in diagnosis of human papillomavirus related diseases. In: Manual of Clinical Laboratory Immunology, 5th Edition. **1996**.
23. Nuovo GJ. The theoretical framework of in situ PCR. In: Methods: A companion to methods in enzymology, Nuovo GJ and Leursen K, eds. **1996**.
24. Kransnokvtsky, S, Khan, A, Nuovo, GJ. The utility of in situ PCR for the study of human papillomavirus-related diseases. In: Methods: A companion to methods in enzymology, Nuovo GJ and Leursen K, eds. **1996**.
25. Steigbigel, R, Nuovo, GJ. New insights into HIV-1 pathogenesis as determined by in situ PCR. In: Methods: A companion to methods in enzymology, Nuovo GJ and Leursen K, eds. **1996**.
26. Nuovo GJ. Troubleshooting in situ PCR. In: Methods: A companion to methods in enzymology, Nuovo GJ and Leursen K, eds. **1996**.
27. Nuovo GJ. PCR in situ hybridization. In: Rapid detection of infectious agents. Friedman H, ed, Plenum Press, **1997**.
28. Nuovo GJ. Preparation of samples for PCR in situ. Scanning Microscopy Interntl 10: 49-55, **1997**.
29. Euscher E, Morrison, C, and Nuovo GJ. Gynecologic Pathology. The Cancer Handbook; Editor in Chief Malcolm R. Alison; Nature Publishing Group Macmillan Publishers Ltd, **2002**.
30. Nuovo GJ. The role of HPV in gynecologic diseases. Adv Pathol Lab Med, Vol 8, **1995**.
31. Nuovo GJ. The role of HPV in gynecologic diseases. Critical Reviews in Clin Lab Sciences, **1998**.
32. Nuovo GJ. The role of HPV in gynecologic diseases: An update. Critical Reviews in Clin Lab Sciences, 37, 183-215, **2000**
33. Nuovo GJ. Co labeling using RT in situ PCR: A review. J Histochem Cytochem, **2001** 49: 1329-39.
34. Nicol AF, Nuovo GJ. RT in situ PCR: Protocols and Applications, Microbial Imaging, - Methods in Microbiology, vol 34, Savidge T and Pothoulakis C, eds, Elsevier Press, UK, **2004; 238-252**

35. Nuovo GJ. Methylation-specific PCR in situ hybridization (chapter 20); in Epigenetics Protocols/Methods in Molecular Biology, vol 287 Humana Press, Ed TO Tollefsbol, **2004**. Pages 261-272.
36. Nicol A Nuovo GJ Detection of HIV-1 provirus and RNA by in situ amplification. In: Methods Mol Biol (**2005**) 304:171-82
37. Euscher E, Morrison, C, and Nuovo GJ. Gynecologic Pathology. The Cancer Handbook; Editor in Chief Malcolm R. Alison; Nature Publishing Group Macmillan Publishers Ltd, **2006**. 2nd edition.

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Section 3: List of textbooks

1. Crum CP, Nuovo GJ. Human papillomavirus and their relationship to genital tract neoplasms. New York, Raven Press **1991.**
2. Nuovo GJ. PCR *in situ* hybridization: Protocols and applications, 1st Edition. New York, Raven Press **1992;** 2nd Edition – **1994,** 3rd Edition **– 1996.**.
3. Nuovo GJ. Cytopathology of the female genital tract: An integrated approach. Baltimore, Williams and Wilkins **1993.**

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Section 4: List of funding

#	Source	Time period	Amount
1.	NIH Training Fellowship-(5T32-CA09503)	1987-88	$25,000
2.	Lewis Foundation	1989-92	$200,000
3.	Life Technologies, Inc	1990-91	$25,000
4.	ONCOR, Corporation	1990-93	$30,000
5.	Roche Molecular Systems	1993-94	$20,000
6.	College of American Pathologists	1993-94	$25,000
7.	Procter and Gamble Company	1993-94	$25,000
8.	Perkin-Elmer Corporation	1993-96	$75,000
9.	Center for Biotechnology, SUNY	1993-96	$100,000
10.	NIH Arthritis and Musculoskeletal disease, (R01AR3327810) collaborator	1993-98	$656,971
11.	ONCOR Corporation	1996-98	$60,000
12.	Schering Plough Corporation	1996-99	$80,000
13.	Becton Dickinson, Inc	1996-99	$110,000
14.	Johnson and Johnson, Inc	1996-99	$60,000
15.	Genetics Institute	1996-98	$55,000
16.	NCI; RF project # 739453; collaborator Devising therapies for AIDS CNS lymphomas	1999-04	$434,200
17.	NCI; RO1 HL-00-012 T-lymphocytes, latent virus, and emphysema pathogenesis - co-Principal investigator	2001-03	$663,188
18.	Zymogenetics; co-PI; IL21 expression in NHLs	2001-02	$32,800
19.	The Lewis Foundation In utero infections	2003-6	$10,000

20. NCI, R21 CA108157-01; Biomodulation of capecitabine by docetaxel in non-small cell lung cancer; collaborator 2004-07 $201,255

The only grant of Dr. Villalona's that you are appointed to is his R21 titled "Biomodulation of capecitabine by docetaxel in non-small cell lung cancer" (Project 746715). The dates of this grant are 4/22/04 - 3/31/07, the amount of annual direct costs is $205,000, and you are appointed at 10% effort which equates to 1.2 calendar months.

21. **R01: IL-15 and Innate Immunity in Acute Graft Versus Host Disease (pending);** collaborator

22. **MyGene Corporation;** Detection of HPV DNA by a microchip array assay; 2005-2006 $40

23. **RO1:** Conduct disorder and pregnancy: HPA axis activity, fetal programming, and mothering; Co-Pi pending $2,985,223